

MALAWI

Strategy Support Program



MALAWI'S FARM INPUT SUBSIDY PROGRAM: WHERE DO WE GO FROM HERE?

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Malawi's Farm Input Subsidy Program (FISP) has dominated the agriculture and food security policy landscape in the country since its inception in 2005/06. FISP is now credited—or blamed, depending on one's viewpoint—for a revival of agricultural input subsidies across Africa as a tool to raise crop productivity and reduce poverty and food insecurity. This follows global reporting about Malawi's dramatic decline in food insecurity after implementing a subsidy program against expert advice. While historically the debate around the desirability of input subsidies tended to focus on whether short-term gains outweighed the long-term opportunity costs of forgone growth-enhancing investments in infrastructure, research, or extension services, a growing body of literature now questions the ability of these programs to even generate short-term, on-farm benefits that outweigh costs. Although discarding FISP may be political suicide in the short term, anecdotal evidence suggests a gradual but marked shift in Malawian public opinion about the effectiveness or even desirability of FISP. This note draws on the recent evaluation literature to identify key policy lessons so far, but also to highlight areas that require further analysis before policymakers can consider major reforms.

INTRODUCTION & PROGRAM OVERVIEW

As a small country with limited resources, a high population density, a large agricultural sector that is predominantly rain-fed, and frequent droughts and floods, Malawi has always been vulnerable to food insecurity. Malawi also has a long history of subsidizing or providing free inputs, particularly chemical fertilizer, mainly to promote maize cultivation (Box 1). Past subsidy programs have varied in scope and scale, but importantly, prior to FISP, the country only produced surplus maize when subsidy programs were universally targeted (Harrigan 2008). This reflects the fact that fertilizer is prohibitively expensive to most Malawian smallholders, especially in more recent times with a weak exchange rate and fertilizer prices at record-high levels, i.e., up to four times the level in 2000 (World Bank 2013a).

Box 1: Malawi's history of fertilizer subsidization

The most comprehensive subsidy program after the Drought Recovery Inputs Project (1992/93) was the Starter Pack (SP) (1998/99 and 1999/2000). SP was universally targeted to 2.8 million beneficiary farm households, providing free seed and fertilizer sufficient for each beneficiary household to cultivate about 0.1 hectares of maize. Due to cost concerns and donor pressure, SP was replaced by the Targeted Input Program (TIP) in 2000/01 and 2001/02 with similar benefits, but targeted at only half of the SP beneficiaries. This downscaling of TIP was partly blamed for the severe food crisis of 2001/02. Hence, in 2002/03 an "extended" TIP was implemented, once again reaching 2.8 million beneficiaries. By 2003/04, TIP was again scaled back (1.7 million beneficiaries), while a near-universal TIP was implemented in 2004/05, an election year. The Agricultural Input Subsidy Program, later renamed the Farm Input Subsidy Program (FISP) was implemented in 2005/06.

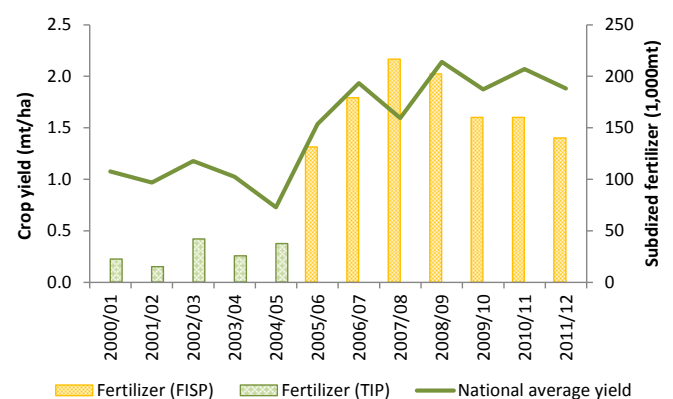
FISP is currently in its eighth year of implementation. Although in the past the program included support measures for the tobacco, coffee, tea, and cotton subsectors, and currently includes a legume component, it remains primarily a maize production subsidy, with the fundamental design principles unchanged since 2005/06. The maize seed component has grown over time, together with a shift in emphasis towards providing hybrid seed varieties, rather than seed of both hybrid and open-pollinated varieties. Planned fertilizer distribution has varied between 150,000–170,000 metric tons (mt) per year, although actual distribution peaked at 216,000 mt in 2007/08 (Figure 1).

Although FISP only targets about 1.5 million or half of all Malawian smallholder households, the program is more generous than earlier programs: the full package includes 5–10 kilogram (kg) of seed and 100 kg of fertilizer, which at reasonable yield levels is sufficient to satisfy annual maize needs for an average-sized family. In reality, however, not all beneficiary households receive the full subsidy package due to sharing of seed or fertilizer coupons. Moreover, the average fertilizer amount received per farmer has declined from around 85 kg in 2006/07 to only 60 kg by 2012/13 as overall subsidized fertilizer volumes gradually declined and the number of eligible household increased rapidly (Dorward et al. 2013).

FISP & ECONOMIC GROWTH

Figure 1, based on official crop estimates, shows the dramatic yield improvement in Malawi at the time FISP was introduced. It also illustrates just how ambitious FISP was in terms of the volume of fertilizer distributed compared to earlier programs. Maize land expanded marginally over the period, which suggests that production increases were driven primarily by yield improvements—from about 1.3 mt to an average of 2.7 mt per ha. Since FISP's introduction, maize production generally has exceeded domestic demand (Dorward et al. 2013).

Figure 1. Maize yields and subsidized fertilizer



Source: Agricultural Production Estimates Survey (APES), Ministry of Agriculture and Food Security (MoAFS); Harrigan (2008); FISP Logistics Unit Implementation Reports (various).

During the first two implementation years (2005–2007), maize productivity growth was a significant driver of agricultural GDP growth (15.9 percent per annum; Table 1). National accounts data suggests the economy expanded at 6.2 percent per annum during this time. In the following years (2007–2011), agricultural GDP growth slowed down as maize yields reached a plateau, but national GDP continued to expand rapidly (7.5 percent per annum) due to strong growth in private services and mining and industry. Although a structural shift in growth is evident, agricultural GDP still contributed more than one-third to overall growth during 2005–2011 (see final column of Table 1), with FISP credited as a major contributor to Malawi’s success (GoM 2012).

Table 1. Malawi’s GDP growth: 2005–2011

	Average annual growth rates (%)			Contribution to change
	2005-2007	2007-2011	2005-2011	2005-2011
Agriculture	15.9	7.3	10.1	34.2
Mining & industry	3.0	11.4	8.5	18.2
Trade and transport	5.5	6.1	5.9	15.2
Private services	7.6	11.7	10.3	23.3
Government services	4.1	6.4	5.6	9.2
National GDP growth	6.2	7.5	7.1	100.0

Source: National Statistical Office (National Accounts, Lilongwe)

THE SUCCESS STORY UNRAVELS

Despite these apparent successes, there were some early concerns that all was not well with the Malawian economy. In particular, the reliability of crop production estimates that underpinned the GDP growth estimates was questioned; for example, literature reviewed by Beck et al. (2013) suggests that (i) crop production estimates were at times inconsistent with maize price behavior; (ii) official yield data are inconsistent with farm-level data from alternative sources; and (iii) simple arithmetic based on expected “marginal returns to fertilizer use” casts serious doubt on the purported production increases (Box 2). Ultimately, given the size of the maize subsector and the importance of agriculture in national GDP, a hugely overestimated maize crop would greatly overestimate GDP growth.

The success story unraveled further with the release of the official poverty estimates in 2012. Based on household survey data from 2004/05 and 2010/11, the National Statistical Office (NSO) revealed that, although national poverty declined from 52.4 to 50.7 percent, rural poverty had in fact increased marginally by 0.7 percentage points. Analysts were left perplexed as to how rapid smallholder-led growth coupled with a significant investment in the rural economy in the form of FISP could have failed to lower rural poverty. Proponents of FISP retorted that the program was never intended as an anti-poverty strategy. Others, most notably Beck et al. (2013), have since challenged the official rural poverty estimates in which the NSO failed to account for significant shifts in consumption patterns across regions and over time in Malawi. Beck et al.’s (2013) own estimates suggest a 6.8 percentage point decline in rural poverty over the same period, which is more consistent with recent patterns of GDP growth. Simulation results further show that FISP, in one implementation year alone, is associated with a 1.8 percentage point reduction in rural poverty (Arndt et al. 2013).

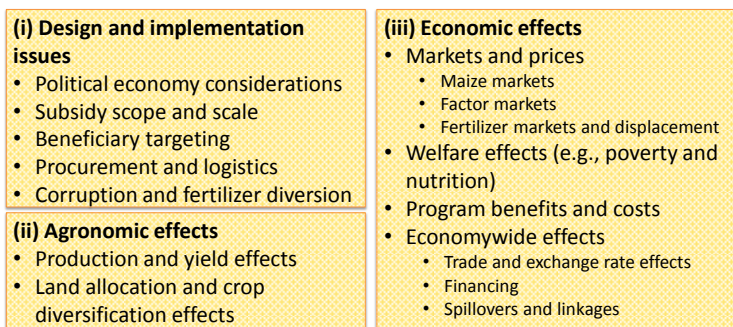
Irrespective of the outcome of the poverty debate, the current reality is that Malawi is now facing one of its toughest socioeconomic challenges of the FISP-era. The Malawi Vulnerability As-

essment Committee (MVAC) estimates that one-in-ten Malawians (or 1.5 million people) will face food shortages in 2013/14 in the face of rampant inflation and a weakening exchange rate. This has raised questions as to the efficacy of FISP in ensuring national food security. However, others argue that current food shortages were entirely predictable since fertilizer disbursement under FISP has not kept pace with population growth (Carr 2014). Nevertheless, the consensus is that “*Malawi has lost its hard-earned status as an agricultural success story*” (Tafirenyika 2013).

EVIDENCE ABOUT FISP IMPACTS

Numerous studies have analyzed the impact of FISP on the Malawian agricultural and socioeconomic landscape. A comprehensive review is offered by Lunduka et al. (2013). These studies or their components can be categorized broadly into analyses of: (i) design and implementation issues; (ii) agronomic or farm-level effects; and (iii) economic effects (Figure 2).

Figure 2. Categorization of FISP evaluations



Many of these analytical areas are closely interlinked; for example, beneficiary targeting may influence production effects and welfare outcomes; diversion may contribute to commercial fertilizer displacement; or the program scale may influence trade and exchange rate effects. In this section we highlight some of the pertinent, often controversial, issues that dominate ongoing debates around the impact and desirability of FISP.

A high marginal return to fertilizer use is crucial to the success of FISP, but opinion about yield gains achieved by FISP beneficiary farmers is divided

The marginal return to fertilizer use measures the additional quantity of maize grain produced per kilogram of nitrogen (kg/kgN) added to the soil, nitrogen being a key chemical component of fertilizer (Box 2). Conventionally, agronomists assume a range of 10–12 kg/kgN when fertilizer is applied to local maize; around 15 kg/kgN for open-pollinated composite varieties; and 18–20 kg/kgN for hybrid varieties (Dorward et al. 2008). Recent evidence from maize field trials suggests an average return of 16.8kg/kgN for Malawi, a level used as a benchmark in some recent evaluation studies.

By contrast, some of the survey evidence suggests that FISP beneficiaries may have fared much worse than the benchmark. Chibwana et al. (2010) and Ricker-Gilbert and Jayne (2012) estimate average marginal returns of 9–12 kg/kgN among FISP beneficiaries, which is significantly below estimates typically found in the literature and for the region. The latter study further shows that the poorest households achieved even lower returns (i.e., around 2.8 kg/kgN), which in part reflects an increased likelihood that poor people cultivate degraded soils, often used as a basis for arguments that fertilizer promotion programs fail to lift smallholders out of poverty.

Box 2: Marginal returns to fertilizer use and FISP

Nitrogen (N) is a key component of fertilizer and a primary nutrient for healthy plant growth. FISP fertilizer includes equal amounts of NPK (23 percent nitrogen) and urea (43 percent nitrogen), or an average of 33 percent nitrogen (Arndt et al. 2013). For a 150,000 mt subsidy program (the amount of fertilizer distributed in 2006/07), roughly 50,000 mt additional nitrogen is added to the soil assuming no displacement. At a reasonable range of 12–18 kilogram grain per kilogram nitrogen (kg/kgN), additional nitrogen should translate to additional production of 600,000–900,000 mt. Compared to pre-FISP levels, the 2006/07 production increase according to the official MoAFS crop estimates was almost 1.5 million metric tons. By contrast the National Census of Agriculture and Livestock of 2006/07 (NSO 2010) suggested incremental production of around 751,000 metric tons, which seems more plausible. As a consequence many have discredited official crop estimates, especially those released during the FISP era.

Getting the number right on the marginal return to fertilizer use is critically important to our understanding of the direct production benefits of FISP. At returns of 9–12 kg/kgN program costs exceed the value of additional maize produced, thus yielding a “production-based” benefit-cost ratio (BCR) of less than one. At the more optimistic rate of 16.8 kg/kgN, the BCR is close to or exceeds one, suggesting benefits exceed costs (Arndt et al. 2013; Dorward et al. 2008).

Commercial fertilizer displacement and illicit diversion of subsidized fertilizer reduce program effectiveness; these are implementation issues that should be addressed through better targeting and logistics management

Commercial fertilizer displacement may be prevalent in subsidy programs that unintentionally target farmers that would have purchased fertilizer in the absence of the subsidy. In Malawi, about 18 percent of commercially-supplied fertilizer is believed to be displaced by FISP, implying that every kilogram of subsidized fertilizer leads to a 0.82 kg net increase in fertilizer use (Jayne et al. 2013). The lower the displacement rate, the larger the net increase in fertilizer use and hence also output. Poorer farmers tend to have lower displacement rates (Ricker-Gilbert et al. 2011); thus, even though the poor might use fertilizer less efficiently, targeting the poor could still lead to a greater net increase in inorganic nitrogen applied.

When subsidized fertilizer is diverted and sold on the secondary market (e.g., through theft or corruption) it may displace some commercial fertilizer sales. Jayne et al. (2013) explain that this form of displacement, estimated to be between 15 and 40 percent for large subsidy programs, is not captured in standard procedures for estimating commercial fertilizer displacement; hence, they argue, the true “total” displacement is the sum of “normal” displacement and illicit diversion. The implication is that up to three-fifths of commercial fertilizer sales may be displaced by FISP, thus suggesting that ex ante models significantly overestimate the production gain.

Although a very pertinent issue, evidence on the extent of diversion remains scant due to its illicit nature. Furthermore, one has to concede that not all diverted fertilizer necessarily displaces commercial fertilizer. Even estimates of displacement are subject to measurement error, especially since in the case of Malawi the “without subsidy” counterfactual now represents a period with significantly lower real fertilizer prices and economic conditions. Moreover, the available series of fertilizer sales data hardly suggest a consistent pattern of commercial fertilizer displacement in Malawi (World Bank 2013b).

Ultimately, depending on how diverted fertilizer is used, its overall production effect may be minimal. That is not to say that diversion does not have important distributional effects. Since diversion implies that intended beneficiaries are excluded, policy-makers must still strive towards eliminating this form of inefficiency through a properly implemented logistics system that tracks fertilizer delivery. Displacement, on the other hand, can be reduced through better targeting, which starts with clearly defined targeting criteria for FISP.

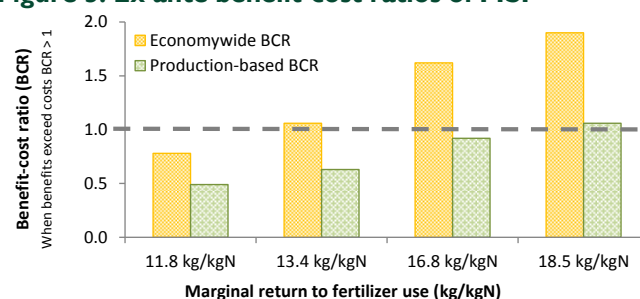
Evidence about land allocation or crop diversification effects is mixed; increased concentration of maize cultivation may be due to a “FISP-effect”, but it may also reflect growing land pressure and declining farm sizes.

Effects on land use are mixed. Whereas Holden and Lunduka (2010) report a decline in overall maize land during FISP implementation years, Chibwana et al. (2012) detect a causal link between FISP and decreased crop diversification among beneficiaries. Kankwamba et al. (2012) concur that overall crop diversification has declined since 2004/05, but present evidence that FISP beneficiaries had more diversified cropping patterns in 2010/11 than non-beneficiaries, possibly due to a tendency for non-beneficiaries to grow more maize in order to become eligible for the subsidy, whereas existing beneficiaries are able to free up land for non-maize crops due to higher maize yields achieved under the subsidy. Ultimately, however, land pressure causes plot sizes to decline over time, which in turn will naturally lead to more intensive cultivation of maize, the main staple. FISP may provide a way in which to promote more intensive maize cultivation while also freeing up land and other resources for cultivation of other crops. This could ultimately promote crop diversification and food security outcomes.

The indirect effects of FISP emanating from increased economic activity, lower food prices, and higher wages are significant and should not be ignored in program evaluations

The economywide assessment by Arndt et al. (2013) complements survey-based evaluations. They find that FISP is reasonably pro-poor and has the potential to generate substantial indirect benefits. Their estimated “economywide” BCR is up to 60 percent higher than the “production-based” BCR, but results are sensitive to the marginal return to fertilizer use. For example, in their benchmark scenario (16.8 kg/kgN) the economywide BCR is 1.6, but falls below 1.0 in the low-return scenario (11.8 kg/kgN) (see Figure 3). At a moderate return (13.4 kg/kgN), Arndt et al.’s (2013) production-based BCR is below one, but the economywide BCR exceeds one, thus making the program viable at least from an economywide perspective. This is testament to the importance of not only considering the direct benefits as most evaluations have done, but also the significant indirect ones.

Figure 3. Ex ante benefit-cost ratios of FISP



Source: Arndt et al. 2013

Arndt et al. (2013) further find that smaller, better targeted programs will raise overall efficiency, but this may lead to food security concerns. As far as risk factors are concerned, Arndt et al. (2013) find that the economywide BCR falls below one when: (i) real fertilizer prices are 50 percent higher than what they were in 2004/05 (i.e., at levels seen today); and (ii) during a one-in-fifteen year or worse drought (Malawi's infamous 1993/94 drought was classified as a one-in-twenty year drought), although the higher drought tolerance of modern seed varieties distributed under FISP means drought-induced losses are lower than what they would have been without FISP.

WHERE DO WE GO FROM HERE?

There is much talk about FISP exit strategies and policy alternatives. However, the available evidence is not convincing enough to simply dismiss FISP as an economic failure. In fact, there are many good reasons not to dispose of FISP, the most important of which is the historical evidence of recurring periods of food deficits when subsidy programs were not widely targeted. Already some are blaming current food deficits on the fact that FISP had been downscaled in a time of high fertilizer costs and a

weak exchange rate. While economically it may at times make sense to import food rather than subsidize its production, Carr (2014) argues that this is not currently the case in Malawi. Moreover, the socio-economic and humanitarian effects of hunger are far-reaching, while the logistical challenges of providing food aid are immense.

However, it is equally important to continue exploring outcomes under policy alternatives, including those that are less prone to weather or price risks. These could be policies within the broader sphere of agricultural policy (e.g., irrigation and rural infrastructure, market linkages and development, credit provisioning and insurance, or research and extension services) or those outside the traditional ambit of agricultural policy (e.g., cash transfers or public works). The Malawian government faces a unique challenge of finding itself in a "public spending trap" where reduced spending on FISP is politically and socially risky. However, as long as FISP crowds out other socio-economic spending, it could have detrimental consequences for growth and welfare outcomes in the long term. These opportunity costs and outcomes under policy alternatives need to be better understood and quantified.

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MaSSP works closely with the government of Malawi and other development partners to provide information relevant for the design and implementation of Malawi's agricultural and rural development strategies.

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